COLL 486: Hyaluronan density influences adhesion, morphology and migration of cancer cells

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Body

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Hyaluronan (HA) is a linear non-sulfated glycosaminoglycan present in the extracellular matrix and known to modulate cell-cell and cell-ECM interactions. In cancer, the synthesis, degradation and signaling of HA is altered. For instance, its main receptor, CD44, is overexpressed in several types of cancer and has been correlated with disease progression through cancer cell proliferation, migration and chemoresistance. Herein, we investigated the behavior of breast cancer cells with different CD44 expression and invasion profile on HA density gradients. These gradients were achieved by deposition of colloidal gold (Au) on amino-functionalized surfaces at different ionic strengths and following binding of end-on thiol modified HA on the Au. At low HA density, small number of adherent round cells were found for all studied cell lines. Cells adherent to the areas with high HA density presented a spindle-like morphology. The differences were more pronounced for cells overexpressing CD44. These cells also form long filopodia when adhered on areas with middle and high HA density. Of note, colocalization of CD44 and actin was observed at the filopodias edges. Cell motility was also affected by the gradient – at low densities cells presented higher motility, which decreased with the increase of HA density. Besides this common trend, we observed differences among the studied cells. $CD44^{++}$ cells had shorter persistent length displacement than $CD44^{+}$ and $CD44^{-}$cells. Upon CD44 blockage, all types of cells (CD44++, CD44+, and CD44-) behave similarly . These results suggest that cells recognize HA gradients through CD44 receptors and that the HA density can be used to sort cells with different expression of this receptor.

Presentation Details

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(/acsboston18/event/2dc326499245001587a05efb580cc5e2)